WGSL AOC Final Report Submission

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Greetings all.

Please find a copy of the text portion of the final report documenting the completion of those requirements under the Administrative Order on Consent (AOC) for WGSL. CDs of the entire report including the text and all appendices was forwarded to you today by certified mail. Please let me know if you have any questions. We appreciate your assistance throughout this project, and look forward to closing out the AOC.

Best regards,

Joe

Joe Whelan

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Waste Management of Hawaii
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Removal Action Summary Report_Text, 8-11-11pdf.pdf

Removal Action Summary Report

WAIMANALO GULCH SANITARY LANDFILL

KAPOLEI, O‘AHU, HAWAI‘I

AUGUST 2011

CONTENTS

ACRONYMS AND ABBREVIATIONS

AECOM	AECOM Technical Services, Inc.
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
City	City and County of Honolulu
CQA	Construction Quality Assurance
DOH	Department of Health, State of Hawaii
EPA	Environmental Protection Agency, United States
GBI	Goodfellow Brothers, Inc.
GCL	geosynthetic clay liner
GEI	GEI Consultants, Inc.
MSW	municipal solid waste
Order	Administrative Order on Consent for Removal Action, CERCLA Docket No. 09-2011-0007
PCS	Pacific Commercial Services, LLC
RCRA	Resource Conservation and Recovery Act
WGSL	Waimanalo Gulch Sanitary Landfill
WMH	Waste Management of Hawaii, Inc.
WWTF	wastewater treatment facility
yd^3	cubic yards

CERTIFICATION

"Under penalty of law, I certify that to the best of my knowledge, after appropriate inquiries of all relevant persons involved in the preparation of the report, the information submitted is true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations."

BY: Joseph R. Whelan DATE: August 10, 2011

Joseph Whelan
General Manager
Waste Management of Hawaii, Inc.

I. SUMMARY OF EVENTS

A. SITE CONDITIONS AND BACKGROUND

1. Initial Situation

The Waimanalo Gulch Sanitary Landfill (WGSL) is an active municipal solid waste (MSW) disposal facility located at 92-460 Farrington Highway in Kapolei, Oahu, Hawai'i and is owned by the City and County of Honolulu (City). Waste Management of Hawaii, Inc. (WMH) is contracted by the City to manage and operate the landfill. WGSL is the only operating municipal solid waste landfill (MSW) on the island of Oahu and receives commercial and residential wastes generated within Oahu, as well as ash and residue from the H-Power power plant. See Figure 1 for a site location map and Figure 2 for a site layout map.

A series of storm events occurring in late December 2010 through mid-January 2011 resulted in high surface stormwater run-on flows that flooded one of the MSW cells (Cell E6) and damaged portions of the liner system. The resultant runoff from the January 12th and 13th storm may have carried waste materials into the WGSL storm water conveyance system, which flows into the sedimentation basin prior to leaving the site at the permitted discharge point and onward to the Pacific Ocean. A removal action was required by the Administrative Order on Consent for Removal Action, Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) Docket Number 09-2011-0007 (Order). While stormwater flowing from Cell E6 likely entrained some waste materials, waste materials from other areas of the landfill could also have been dislodged and entrained in stormwater that also flowed to the conveyance system.

2. Cause of Release or Discharge

In late December 2010, a series of storms produced high stormwater run-on at the site resulting in damage to the northeastern edge of the MSW Cell E6 liner where it joins with Cell E4. An even larger storm arrived on the evening of January 12, 2011 that resulted in additional flooding of the landfill and damaged the exposed portion of the western sideslope area of the MSW Cell E6 liner system.

Table 1 summarizes the daily precipitation of the major storm events prior to the release from the site. Rain data is provided for an on-site down gradient rain gauge located at the administration building and a rain gauge located up-canyon of the site. Monthly summaries for the December 2010 and January 2011 daily precipitation is presented in Table 2. Daily summaries of the rain precipitation for the period of December 1, 2010 to June 21, 2011 are presented in Figure 3 – 5.

Table 1: Major Rain Event Summary

Date	Daily Precipitation (in) On-Site Gauge	Daily Precipitation (in) Up-Canyon Gauge
12/19/2010	5.4	8.4
12/27/2010	2.2	4.3
1/12/2011	5.0	9.2
1/13/2011	2.0	10.3

Table 2: Monthly Precipitation Summary

Month	Daily Precipitation (in) On-Site Gauge	Daily Precipitation (in) Up-Canyon Gauge
December	11.9	27.4
January	7.3	20.9

The high water flows during the January 12th-13th storm resulted in erosion of the Cell E6 termination bench and exposed the operations layer soils covering the sideslope liner, thereby exposing the liner to subsequent damage by falling rocks in addition to allowing sections of the liner to pull down from the termination bench creating wrinkles. Due to numerous holes in the exposed sideslope liner at the northern end of the cell caused by falling rocks, water and sediment were able to flow between the geotextile, 60-mil geomembrane, and geosynthetic clay liner (GCL) layers. Portions of the GCL in the middle area of the sideslope area were hydrated and covered with sediment due to the water and sediment flow.

A Severe Storm Damage Report (included in Appendix D) documents the inspection that followed the January 12-13, 2011 storm event. The inspection found several damaged areas including flooding of the MSW Cell E6 and damage to the drainage structures, landfill liner, drainage swales, and access roads.

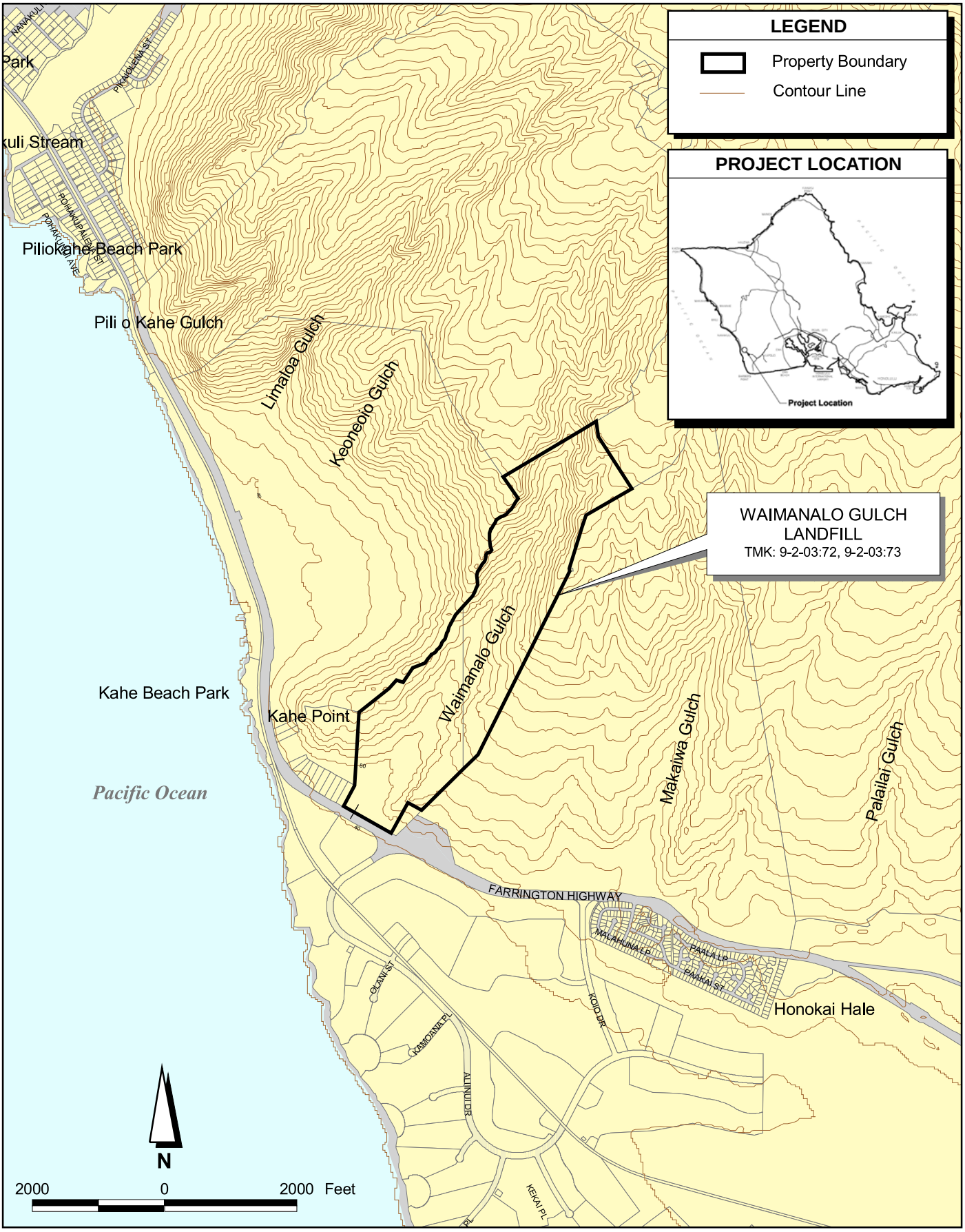

Figure 1
Site Location Map
Waimanalo Sanitary Gulch Landfill
Kapolei, Hawaii

NOTES
1. DATE OF FLIGHT: JUNE 7, 2010
2. PROPERTY BOUNDARY AND CELL LOCATION APPROXIMATE

LEGEND	
———	PROPERTY BOUNDARY
———	CELL BOUNDARY

CULVERT ENTRANCE

SITE ENTRANCE

DETENTION POND

MAIN HAUL ROAD

CONCRETE–LINED DRAINAGE CHANNEL

ASH CELL 1
ASH CELL 2
ASH CELL 3
ASH CELL 4
ASH CELL 5
ASH CELL 6
ASH CELL 7
ASH CELL 8
MSW CELL 1
MSW CELL 2
MSW CELL 3
MSW CELL 4A
MSW CELL 4B
MSW CELL 4C
MSW CELL 5
MSW CELL 6
MSW CELL 7
MSW CELL 8
MSW CELL 9
MSW CELL 10
MSW CELL 11
MSW CELL E1
MSW CELL E2
MSW CELL E3
MSW CELL E4
MSW CELL E5
MSW CELL E6
MSW CELL E7
ASH CELL E8
MSW CELL E9

ADMINISTRATION BUILDING

SCALEHOUSE AND SCALES

LANDFILL GAS FLARE

PROPERTY BOUNDARY

PERMITTED LIMIT OF LANDFILL

N

Figure 2
Site Layout Map
Waimanalo Gulch Sanitary Landfill
Kapolei, Oahu, Hawaii

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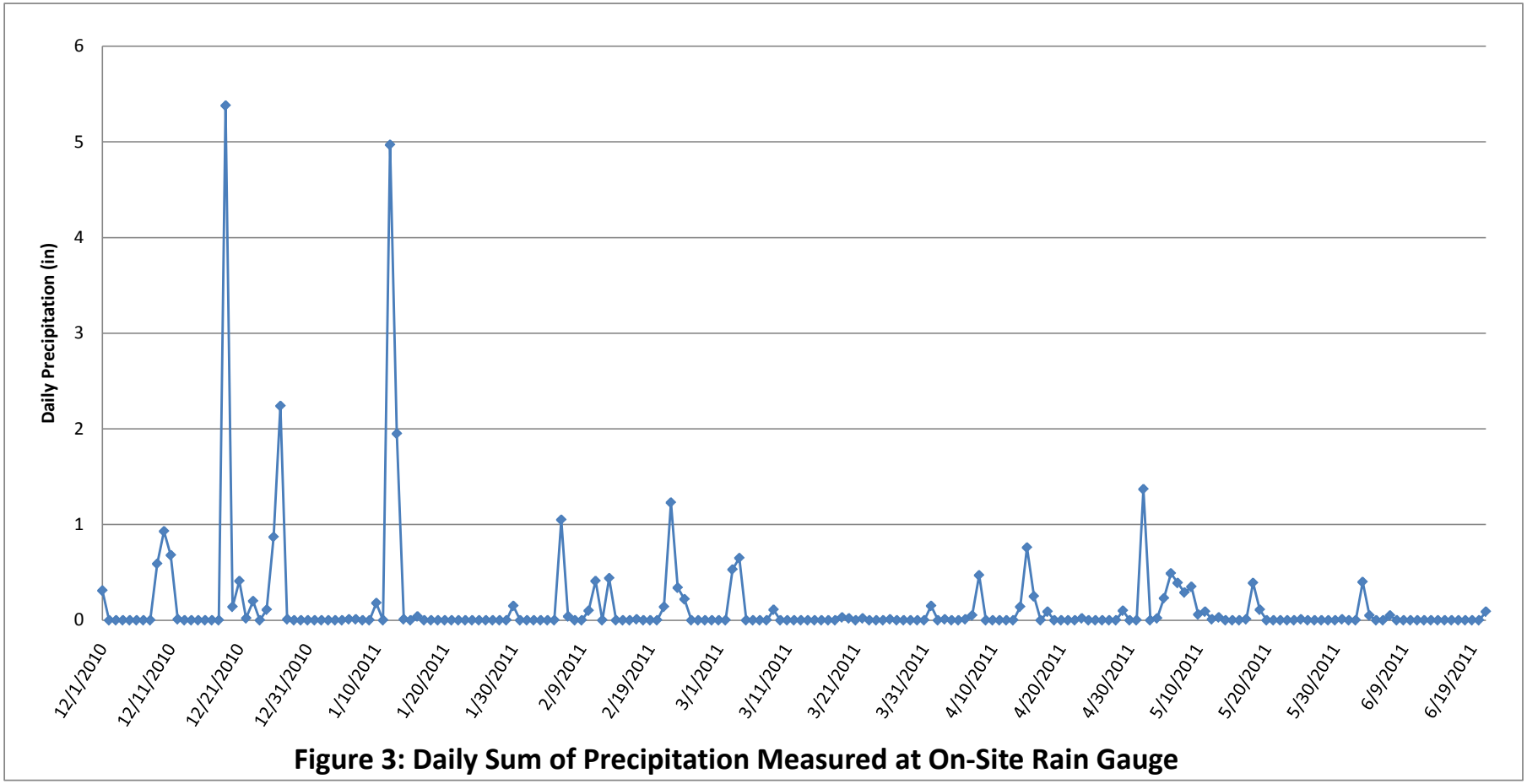

Figure 3: Daily Sum of Precipitation Measured at On-Site Rain Gauge

Source: WGSL on-site rain gauge located at the administration building.

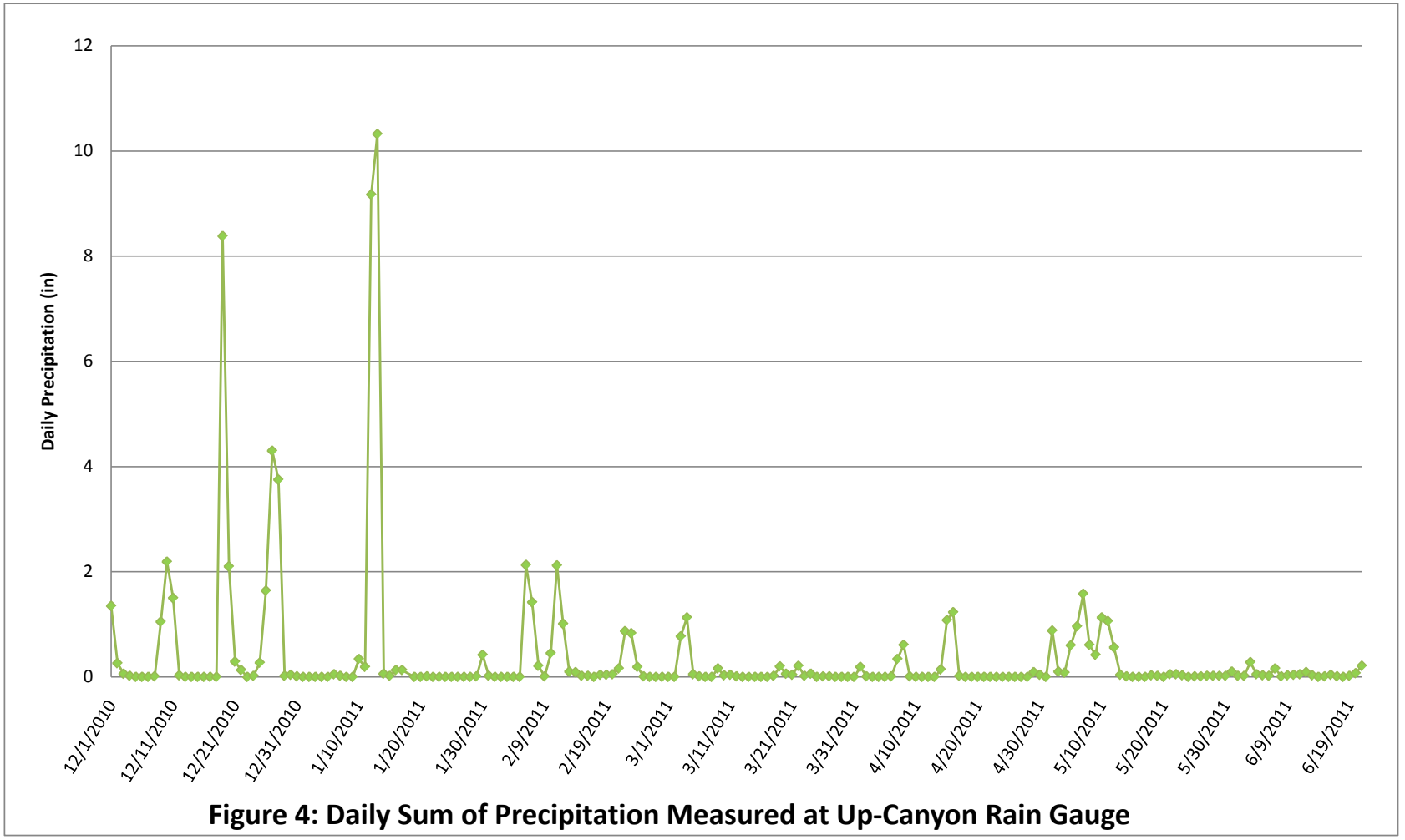

Figure 4: Daily Sum of Precipitation Measured at Up-Canyon Rain Gauge

Source: Data from rain gauge "MPLHHL" located up-canyon of the WGSL.
Weather Underground. 2011. http://www.wunderground.com/cgi-bin/findweather/getForecast?query=Kapolei, Hawaii. June (6/23/11).

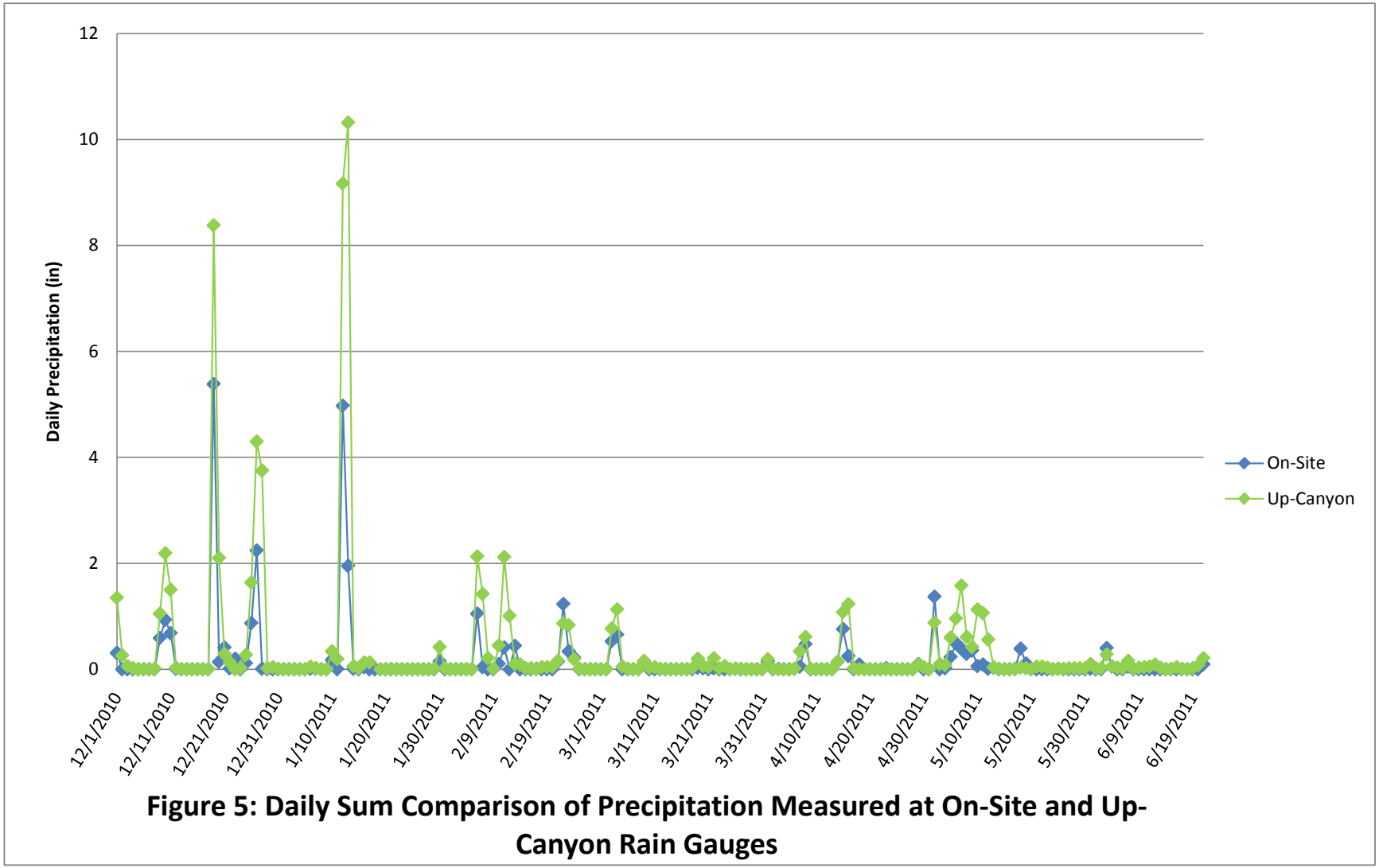

Figure 5: Daily Sum Comparison of Precipitation Measured at On-Site and Up-Canyon Rain Gauges

B. ORGANIZATION OF THE RESPONSE

Response actions were conducted in accordance with the timeline mandated by the Order. As specified in the Order, WMH retained several contractors to perform the work required by the EPA, and notified the EPA and DOH of the names and qualifications of the contractors within two days of the Effective Date. The Effective Date of the Order was January 25, 2011 and the submittal of the contractors was made on the same day, correspondence is presented in Appendix A. Contractors used during the removal action are identified in Table 3. WMH designated Joseph Whelan as Project Coordinator. As required by the Order, Mr. Whelan was present on site and/or readily available during site work. Correspondence between the Project Coordinator and the EPA is presented in Appendix A.

Table 3: Organization of Response

Agencies or Parties Involved	Contact	Description of Participation
EPA – Region 9 (SFD-9)	Bret Moxley 75 Hawthorne Street San Francisco, CA 94105	EPA On-Scene Coordinator (OSC)
EPA – Region 9 (WST-5)	Katherine Baylor 75 Hawthorne Street San Francisco, CA 94105	RCRA Action Officer (RAO)
DOH, Environmental Management Division	Stuart Yamada, P.E., Chief 919 Ala Moana Blvd., Room 300 Honolulu, HI 96814-4920	State Agency Oversight
City and County of Honolulu, Department of Environmental Services, Refuse Division	Wilma Namumnart, P.E. Acting Chief 1000 Uluohia Street, Suite 212 Kapolei, HI 96707	Landfill Owner
WMH	Joe Whelan, General Manager 92-460 Farrington Highway Kapolei, HI 96707	Project Coordinator/ Landfill Operator
GEI	William A. Rettberg, P.E. 180 Grand Ave, Ste 1410 Oakland, California 94612	Western Drainage Project Design Engineer Contractor
Geosyntec Consultants, Inc.	Hari D. Sharma, Ph.D., P.E. 180 Grand Ave, Ste 1410 Oakland, CA 94612	Liner System Design Engineer Contractor
PCS	Jingbo Chang, Ph.D. PO Box 235117 Honolulu, HI 96823	Storm Water/Leachate Disposal Contractor
GBI	Matt Heahlke 93-061 Waipio Point Access Road Waipahu, HI 96797	Earthwork/Construction Contractor
AECOM	Ron Boyle, P.E. 1001 Bishop St, Ste 1600 Honolulu, HI 96813	Construction Quality Assurance Contractor

AECOM AECOM Technical Services, Inc.
DOH Department of Health, State of Hawaii
EPA Environmental Protection Agency, United States
GBI Goodfellow Brothers, Inc.
GEI GEI Consultants, Inc.
PCS Pacific Commercial Services, LLC

C. CHRONOLOGICAL NARRATIVE OF RESPONSE ACTIONS

The follow sections detail the response actions taken. The response was performed in accordance with the Order, under the authority of CERCLA.

1. Threat Abatement Actions Taken

Measures taken to prevent future storm damage at the site and to document efforts to further contain potential storm water and prevent waste material from exiting the facility in the event of additional storm events are described in the *Stormwater Management Update and Contingency Plan*. This document was updated several times throughout the response action; the three versions dated January 27, 2011, February 1, 2011 and February 18, 2011 are presented in Appendix B.

Table 4 presents the response actions completed during the removal action, in chronological order, as outlined in Section VIII of the Order.

Table 4: Response Action Activities

Item	Subject	Administrative Order Action Requirement
19g.	Operation of Cell E6	Respondent shall not operate cell #E6 without further approval from EPA.
Action Taken: In an e-mail dated January 28, 2011 the EPA approved WMH to resume operations on the east side of Cell E6, correspondence is presented in Appendix A.		
19c.	Storm Water Discharge	Respondent shall ensure the termination of discharges of liquid originated from cell #E6 to the Pacific Ocean, except as in compliance with any applicable permit.
Action Taken: Storm water discharges were in compliance with the applicable permits, or were approved by the DOH.		
20.	Work Plans and Implementation	Respondent shall submit to EPA for approval a draft Work Plan or individual Work Plans for performing the response actions generally described in Paragraph 19 of the Order. EPA may approve, disapprove, require revision to or modify any draft Work Plan in whole or in part. If EPA requires revisions, Respondents hall submit a revised draft Work Plan within fifteen (15) days of receipt of EPA's notification of the required revision. Respondent shall implement each respective Work Plan as approved in writing by EPA in accordance with its schedule approved by EPA. Once approve, or approved with modifications, each Work Plan, its schedule, and any subsequent modifications shall be incorporated into and become fully enforceable under this Order. Respondent shall not conduct any Work except in conformance with the terms of this Order, or as directed by EPA.
Action Taken: All work plans were submitted to the EPA for approval and revised according to schedule. Correspondence for submittals and work plans are presented in Appendix A and Appendix B, respectively.		
22.	Quality Assurance and Sampling	Although none is presently anticipated, all sampling and analyses performed pursuant to this Order shall conform to EPA direction, approval, and guidance regarding sampling, quality assurance/quality control ("QA/QC"), data validation, and chain of custody procedures.
Action Taken: Sampling was not performed for EPA reporting purposes and as part of the removal action.		
24.	Reporting	Beginning two (2) days after the Effective Date, Respondent shall submit by e-mail to EPA and DOH daily, until agreed otherwise by the Parties, progress reports (Monday through Friday only, unless otherwise requested by EPA) concerning actions undertaken pursuant to this Order, until receipt of the Notice of Completion pursuant to this Order, unless otherwise directed in writing by the OSC or RAO. These reports shall describe all significant developments during the preceding period, including the actions performed and any problems encountered, analytical data received during the reporting period, and the developments anticipated during the next reporting period, including a schedule of actions to be performed under any approved Work Plan, anticipated problems, and planned resolutions of past or anticipated problems. Respondent shall submit copies of all plans, reports (other than progress reports) or other submissions required by this Order, or any approved Work Plan, to both EPA and DOH in electronic form (Word or pdf - minimum 300 dpi).

Item	Subject	Administrative Order Action Requirement
Action Taken: WMH submitted Daily Progress Reports as required by the EPA. All e-mail correspondence is presented chronologically in Appendix A. Copies of all documents required by the Order were submitted electronically. The documents included: • Stability analysis of temporary earthen berm by a Civil/Geotechnical Engineer (Appendix D) • Work Plans (Appendix B): o Collection and Transport of Liquid Behind Temporary Berm o Slope Stability Analysis and Work Plan for Temporary Earthen Berm Integrity o Work Plan for Managing Potential Cell E6 Hydraulic Head o Work Plan for Liner Evaluation and Repair o Work Plan for Restoration of Sedimentation Basin o Work Plan For Beach Assessment and Material Recovery Effort • Written description of collection/treatment activities of liquids (presented in the Daily Progress Reports in Appendix A) • Health and Safety Plan (Appendix C) In an e-mail dated March 17, 2011, the EPA granted the WMH request to replace daily progress reports with a weekly report submitted by noon every Wednesday, documenting work completed during the period of the prior Monday thru Sunday. In an e-mail dated June 22, 2011, the EPA granted the WMH request to terminate the weekly progress reports.		
19d.	Storm water Removal	Respondent shall continue to collect and transport to a local treatment facility the liquids at the site retained behind the temporary earthen berm in cell #E6. Within seven (7) days of the Effective Date, Respondent shall provide a written description of the collection and treatment activities, the current permitting and the chemical parameters of the liquids, and transportation methods to the local treatment facility.
Action Taken: Storm water was pumped and transported to a WWTP in Kailua, HI. The first work plan was submitted on February 1, 2011. In an e-mail dated February 10, 2011, the EPA noted that the description of collection and treatment associated with liquid located behind the temporary berm were acceptable with incorporation of the provided comments; revisions and resubmission were required. The revised work plan was submitted on February 25, 2011 and is included in Appendix B.		
21.	Health and Safety Plan	Within seven (7) days, Respondent shall submit for EPA review and comment a Site Health and Safety Plan that ensures the protection of the public health and safety during performance of on-Site Work. This plan shall be prepared in accordance with EPA's Standard Operating Safety Guide (PUB 9285.1-03, PB 92-963414, June 1992), if applicable. In addition, the plan shall comply with all currently applicable Occupational Safety and Health Administration ("OSHA") regulations found at 29 CRF Part 1910.
Action Taken: A site *Health and Safety Plan* was submitted on February 1, 2011 and is presented in Appendix C.		
19e.	Work Plan for Hydraulic Head	Within seven (7) days of the Effective Date, Respondent shall provide to EPA and DOH a Work Plan and schedule, subject to modification based on further field analysis, for managing the hydraulic head between cell #E6 and the fluids outside of cell #E6 in order to maintain the integrity of the cell liner as the fluids are drawn down and the leachate collection system is returned to normal functions.

Item	Subject	Administrative Order Action Requirement
Action Taken: The work plan was submitted on February 1, 2011 and is presented in Appendix B. In an e-mail dated February 10, 2011, the EPA approved the work plan. The *Evaluation of Hydraulic Head Below Liner System Summary Report* was submitted to the EPA on February 25. The e-mail submittal is included in Appendix A and a copy of the summary report is included in Appendix D.		
19h.	Work Plan and Schedule for Sediment Basin Restoration	Within seven (7) days of the Effective Date, Respondent shall provide to EPA and DOH a Work Plan and schedule to restore the sediment basin system to its intended capacity and function. This shall include removal of the sediment collected in the basin(s) and the proposed disposal location for the collected sediments
Action Taken: The work plan was submitted on February 1, 2011 and is presented in Appendix B. In an e-mail dated February 10, 2011, the EPA noted that the submitted work plan was acceptable with incorporation of provided comments; revision and resubmissions were required. In e-mail dated March 4, 2011, the work plan was approved, and suggested a completion date of March 14, 2011. However, due to continued rain events during the restoration of the basin, WMH requested a later deadline of May 15, 2011. After continued rain events, WMH requested an additional extension via e-mail on May 5, 2011. In an e-mail dated May 6, 2011, the EPA approved an extension to June 15, 2011. In an e-mail dated June 15, 2011 WMH submitted the *Sedimentation Basin Restoration Observation Report.* Following comments provided by the EPA, additional work was conducted on the sediment basin and an Addendum report was submitted on August 4, 2011. The submittal correspondence is presented in Appendix A and the reports are included in Appendix D.		
19i.	Work Plan and Schedule for Beach Assessment and Debris Recovery	Within seven (7) days of the Effective Date, Respondent shall provide to EPA and DOH a Work Plan and schedule for ongoing daily beach assessment and recovery of Waste Material released from the WGSL.
Action Taken: The work plan was submitted on February 1, 2011 and is presented in Appendix B. In an e-mail dated February 10, 2011, the EPA noted that the submitted work plan was acceptable with incorporation of provided comments; revision and resubmissions were required. In an e-mail dated March 4, 2011, the EPA approved the work plan. The work plan is presented in Appendix B. After a final beach assessment on January 24, 2011, WMH noted that the daily beach assessment phase was complete; no calls were received at the established beach waste hot line during the subsequent reporting periods.		
19a.	Temporary Earthen Berm	Within ten (10) days of the Effective Date, Respondent shall provide to EPA and DOH an analysis by a qualified Civil or Geotechnical Engineer of the stability and suitability of the temporary earthen berm, which is currently retaining liquid in cell #E6, to retain liquid when full to within one (1) foot of the top for up to six (6) weeks, and a Work Plan to ensure the integrity of the temporary earthen berm so long as it is holding liquid
Action Taken: A report entitled *Slope Stability Analysis and Work Plan for Temporary Earthen Berm Integrity* was submitted to the EPA on February 4, 2011 by e-mail and Certified Mail. The report found that the temporary berm met and/or exceeded minimum accepted factors of safety and no modifications were necessary. The e-mail and report can be found in Appendix A and Appendix B, respectively.		
19f.	Work Plan and Schedule for E6 Liner Repair	Within fourteen (14) days of the Effective Date, Respondent shall provide to EPA and DOH a Work Plan and schedule to evaluate and demonstrate or restore the integrity of the liner system in cell #E6

Item	Subject	Administrative Order Action Requirement
Action Taken: The work plan was submitted to the EPA on February 4, 2011. In an e-mail dated February 10, 2011, the EPA noted that the submitted work plan was acceptable; revision and resubmissions were not required. Submittal correspondence is included in Appendix A and a copy of the work plan is presented in Appendix B. CQA reports documenting the liner repairs related to the storm damage was submitted under separate cover as specific areas were repaired. Copies of the CQA repair reports are included in Appendix D.		
19b.	Storm water Diversion Structure	Within twenty-one (21) days of the Effective Date, Respondent shall complete construction of a functional storm water diversion structure on the west side above cell #E6.
Action Taken: In an e-mail dated February 15, 2011, WMH confirmed that construction of a functional storm water diversion structure located on the west side above Cell E6 was functionally complete. In an e-mail dated February 16, 2011, the EPA concurred that WMH completed construction of a functional storm water diversion structure as required by paragraph 19b. In addition, in an e-mail dated March 11, 2011, WMH submitted a revised *Surface Water Management Plan* to the EPA and DOH. All correspondence is presented in Appendix A, and the *Surface Water Management Plan* is in Appendix D.		
25.	Final Report	Within sixty (60) days after completion of all Work required by this Order, Respondent shall submit for EPA review and approval a final report summarizing the actions taken to comply with this Order. The final report shall conform, at a minimum, with the requirements set forth in Section 300.165 of the NCP entitled "OSC Reports." The final report shall include a good faith estimate of total costs or a statement of actual costs incurred in complying with the Order, a listing of quantities and types of materials removed off-Site or handled on-Site, a discussion of removal and disposal options considered for those materials, a listing of the ultimate destination(s) of those materials, a presentation of the analytical results of all sampling and analyses performed, and accompanying appendices containing all relevant documentation generated during the removal action (e.g., manifests, invoices, bills, contracts, and permits). The final report shall also include the following certification signed by a person who supervised or directed the preparation of that report: "Under penalty of law, I certify that to the best of my knowledge, after appropriate inquiries of all relevant persons involved in the preparation of the report, the information submitted is true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations."
Action Taken: This report fulfills the requirements described in Paragraph 25.		
26.	Off-site Shipments	Respondent shall, prior to any off-Site shipment of Waste Material from the Site to an out-of-state waste management facility, provide written notification of such shipment of Waste Material to the appropriate state environmental official in the receiving facility's state and to the OSC and RAO.
Action Taken: No Waste Material, as defined in Section III.r of the Order, was shipped off-site during the response activities.		

CQA Construction Quality Assurance
WWTP wastewater treatment plant

2. Treatment/Disposal/Alternative Technology Approaches Pursued

WMH contracted Pacific Commercial Services, LLC (PCS) to pump and transfer storm water to the wastewater treatment plant (WWTP) in Kailua, HI. A summary of the materials pumped during the removal action is presented in Table 5. In addition to the material shown in Table 5, WMH removed approximately 806,500 gallons of storm water and 14,610 cubic yards (yd^3) of sediment from the sedimentation basin during the restoration activities, as discussed in the *Sedimentation Basin Restoration Observation Report* dated June 15, 2011 (included in Appendix D). A summary of the liquid transported and disposed of at the WWTP is presented in Table 6. Note that quantities of liquid pumped and transported by the City during the removal action are not included in this report.

Table 5: Materials/Quantities Pumped during Removal Action

Reporting Date	Location	Amount Pumped (gallons)	Material	Disposal Area
1/27/11	Cell E6 Leachate Riser	12,000	mud	On-site
1/27/11	Sedimentation Basin	60,000	Water	WWTP
1/28/11	Cell E6 Leachate Riser	20,321	Silt	On-site
1/28/11	Sedimentation Basin	60,000	Water	WWTP
1/31/11	Cell E6 Leachate Riser	2 ft	Silt	On-site
1/31/11	Sedimentation Basin	274,000	Water	WWTP
2/1/11	Cell E6 Leachate Riser	16,500	Water	WWTP
2/1/11	Cell E6 Leachate Riser	16,000	Mud/Water Mixture	Frac Tanks for Separation
2/1/11	Sedimentation Basin	56,000	Water	WWTP
2/2/11	Cell E6 Leachate Riser	16,500	Water	WWTP
2/2/11	Cell E6 Leachate Riser	10,000	Mud/Water Mixture	Frac Tanks for Separation
2/2/11	Sedimentation Basin	105,800	Water	WWTP
2/3/11	Cell E6 Leachate Riser	12,500	Mud/Water Mixture	Frac Tanks for Separation
2/3/11	Sedimentation Basin	55,800	Water	WWTP
2/4/11	Cell E6 Leachate Riser	10,000	Mud/Water Mixture	Frac Tanks for Separation
2/4/11	Sedimentation Basin	61,500	Water	WWTP
2/7/11	Cell E6 Leachate Riser	2,500	Mud/Water Mixture	Frac Tanks for Separation
2/7/11	Sedimentation Basin	24,700	Water	WWTP
2/8/11	Sedimentation Basin	44,800	Water	WWTP
2/9/11	Sedimentation basin	52,277	Water	WWTP
2/10/11	Cell E6 Leachate Riser	19,350	Mud/Water Mixture	Frac Tanks for Separation
2/10/11	Frac Tanks	16,500	Water	WWTP
2/10/11	Sedimentation Basin	41,249	Water	WWTP
2/11/11	Cell E6 Leachate Riser	9,675	Mud/Water Mixture	Frac Tanks for Separation
2/11/12	Sedimentation Basin	19,350	Water	WWTP
2/14/11	Cell E6	32,818	Water	WWTP
2/14/11	Cell E6 Leachate Riser	27,000	Mud/Water Mixture	Frac Tanks for Separation
2/14/11	Sedimentation Basin	32,700	Water	WWTP
2/15/11	Cell E6	47,759	Water	WWTP
2/15/11	Cell E6 Leachate Riser	44,000	Mud/Water Mixture	Frac Tanks for Separation
2/15/11	Sedimentation Basin	17,318	Water	WWTP
2/16/11	Cell E6	18,100	Water	WWTP
2/16/11	Cell E6 Leachate Riser	33,200	Water	WWTP
2/16/11	Cell E6 Leachate Riser	27,700	Mud/Water Mixture	Frac Tanks for Separation
2/17/11	Cell E6 Leachate Riser	55,000	Mud/Water Mixture	Frac Tanks for Separation

Reporting Date	Location	Amount Pumped (gallons)	Material	Disposal Area
2/17/11	Sedimentation Basin	31,675	Water	WWTP
2/1711	Sedimentation Basin	--	Silt/Rock	Lined portion of Cell E6
2/18/11	Frac Tanks	56,700	Water	WWTP
2/18/11	Sedimentation Basin	57,718	Water	WWTP
2/18/11	Sedimentation Basin	--	Silt/Rock	Lined portion of Cell E6
2/21/11	Frac Tanks	108,000	Water	WWTP
2/21/11	Sedimentation Basin	--	Silt/Rock	Lined portion of Cell E6
2/22/11	Frac Tanks	33,900	Water	WWTP
2/22/11	Sedimentation Basin	--	Silt/Rock	Lined portion of Cell E6
2/23/11	Sedimentation Basin	41,700	Water	WWTP
2/24/11	Sedimentation Basin	54,900	Water	WWTP
2/25/11	Sedimentation Basin	56,800	Water	WWTP
2/28/11	Frac Tanks	105,300	Water	WWTP
2/28/11	Cell E6 Leachate Riser South Pond Area	33,200	Water	WWTP
2/28/11	Cell E6 Leachate Riser South Pond Area	30,772	Mud/Water Mixture	Frac Tanks for Separation
2/28/11	Sedimentation Basin	8,700	Water	WWTP
3/1/11	Frac Tanks	30,700	Water	WWTP
3/1/11	Cell E6 Leachate Riser South Pond Area	11,000	Water	WWTP
3/1/11	Sedimentation Basin	15,500	Water	WWTP
3/2/11	Frac Tanks	13,000	Water	WWTP
3/2/11	Sedimentation Basin	40,000	Water	WWTP
3/3/11	Frac Tanks	12,018	Water	WWTP
3/3/11	Cell E6 Leachate Riser South Pond Area	25,000	Water	WWTP
3/3/11	Sedimentation Basin	51,000	Water	WWTP
3/4/11	Frac Tanks	14,949	Water	WWTP
3/4/11	Sedimentation Basin	59,700	Water	WWTP
3/7/11	Frac Tanks	36,200	Water	WWTP
3/7/11	Sedimentation Basin	113,000	Water	WWTP
3/8/11	Sedimentation Basin	76,200	Water	WWTP
3/9/11	Frac Tanks	15,100	Water	WWTP
3/9/11	Sedimentation Basin	75,300	Water	WWTP
3/10/11	Frac Tanks	6,359	Water	WWTP
3/10/11	Sedimentation Basin	84,000	Water	WWTP
3/11/11	Frac Tanks	3,159	Water	WWTP
3/11/11	Sedimentation Basin	26,500	Water	WWTP
3/14/11	Frac Tanks	20,677	Water	WWTP
3/14/11	Sedimentation Basin	126,000	Water	WWTP
3/15/11	Frac Tanks	8,769	Water	WWTP
3/15/11	Cell E6 Leachate Riser South Pond Area	1,518	Water	WWTP
3/15/11	Sedimentation Basin	71,476	Water	WWTP
3/16/11	Frac Tanks	6,318	Water	WWTP
3/16/11	Cell E6 Leachate Riser	1,300	Water	WWTP

Reporting Date	Location	Amount Pumped (gallons)	Material	Disposal Area
	South Pond Area			
3/16/11	Sedimentation Basin	91,400	Water	WWTP
Week Ending 3/20/11	Frac Tanks	31,698	Water	WWTP
Week Ending 3/20/11	Sedimentation Basin	221,300	Water	WWTP
Week Ending 3/27/11	Frac Tanks	52,434	Water	WWTP
Week Ending 3/27/11	Sedimentation Basin	105,900	Water	WWTP
Week Ending 4/3/11	Frac Tanks	51,663	Water	WWTP
Week Ending 4/10/11	Frac Tanks	35,586	Water	WWTP
Week Ending 4/10/11	Sedimentation Basin	15,000	Water	On-Site (Dust Control)[a]
Week Ending 4/17/11	Frac Tanks	26,006	Water	WWTP
Week Ending 4/24/11	Frac Tanks	4,159	Water	WWTP
Week Ending 5/1/11	Frac Tanks	1,000	Water	WWTP
Week Ending 5/8/11	Frac Tanks	63,611	Water	WWTP
Week Ending 5/15/11	Frac Tanks	9,477	Water	WWTP
Week Ending 5/22/11	Frac Tanks	56,914	Water	WWTP
Week Ending 5/29/11	Frac Tank	25,216	Water	WWTP
Week Ending 6/3/11	Frac Tank	34,075	Water	WWTP
Week Ending 6/12/11	Frac Tanks	33,343	Water	WWTP

Notes:
[a] Approval via e-mail from DOH dated 3/23/11 to use sedimentation basin storm water for onsite dust control and irrigation. The quantity of water pumped was no longer recorded after this date.

Table 6: Total Liquid Disposed of at WWTP

Origin	Total Liquid Disposed of between 1/28/2011 – 6/12/2011 (gallons) [c]
Cell E6	98,677
Cell 6 Leachate Riser [a]	138,218
Frac Tanks	853,540
Sedimentation Basin [b]	2,314,263
TOTAL	**3,306,021**

Notes:
[a] Does not include mud/water mixture pumped into frac tanks on site.
[b] Does not include storm water pumped to use for onsite dust control and irrigation.
[c] Quantities of liquid do not include liquid pumped by the City from Cell E6 and the sedimentation basin.

3. Public Information and Community Relations Activities

WMH and the City published several press releases summarizing the response activities. Press releases are included in Appendix A for the following dates: January 24, 2011, January 25, 2011, January 31, 2011, February 8, 2011, and February 15, 2011.

As presented in the January 24, 2011 press release, a summary of the public notices, shoreline cleanup activities, and reporting hotline includes the following:

- Thursday, January 13 — WMH evaluated storm water conditions throughout the day of the storm event and determined that a large body of storm water had collected in the area of the new cell construction. Working in collaboration with the DOH, WM, and the City installed warning signs in the shoreline area of the Ko Olina Resort, where the landfill outfall is located, and along the associated beach shoreline. Additionally, WMH and the City began a water quality sampling program that same day. Later on January 13, WMH began debris

cleanup at the overflow and the storm water sedimentation basin once the flood waters had subsided enough to perform this operation safely. At that time, it was determined that the debris also contained sterilized medical waste.

- Friday, January 14 — WMH dispatched an evaluation and cleanup team to the ocean side of the landfill's permitted storm water outfall, located on the north end of the Ko Olina Resort property across Farrington Highway from the landfill. The crew spent several hours cleaning debris from this area. At the time, there was no apparent evidence of remaining medical waste material. WMH continued to clean up areas located between the sediment basin and the permitted outfall. Also on January 14, representatives of WMH, the City, and DOH held a press conference at the landfill to further inform the public of potential concerns associated with the storm events, and to provide an update on the cleanup efforts, warning sign postings, and water quality sampling being performed by WMH and the City. Numerous news interviews and media announcements were provided by all parties over the following several days in order to keep the public fully informed.
- Saturday, January 15 — WMH personnel continued evaluation of the shoreline area. In the afternoon, additional medical waste material was reported in the WMH outfall area located near the Ko Olina Resort area.
- Sunday, January 16 — At 7 a.m., WMH sent its cleanup crew back to the area and evaluated an approximate one-half to three-quarters of a mile section of the beach, including a return to the outfall area. No further medical waste was noted by WMH personnel at this time. Additionally, a hotline was also set up to provide the public with the opportunity to report any observations of medical waste material found on local beaches. The DOH announced the hotline to the public via news media, and WMH representatives continued to remind news media to include the hotline in any further media updates. WMH representatives used reports provided via the hotline to evaluate information and determine where to concentrate its ongoing daily cleanup efforts. Subsequently, in the afternoon of January 16, WMH was notified that some plastic syringes (absent needles) had been found at the White Plains beach located farther south on the shoreline. WMH dispatched cleanup crews to this beach, as well as the Kahe public beach located to the north of the WMH permitted outfall.
- Monday, January 17 — By 8 a.m., WMH cleanup crews were sent to all three of the aforementioned areas and collected additional debris from the shoreline, including what appeared to be a lessening amount of medical waste.
- Tuesday, January 18 — By 8 a.m., WMH dispatched cleanup crews, initially focusing attention at Nimitz beach, followed by White Plains, and then the storm water outfall.
- Wednesday, January 19 — By 8 a.m., the cleanup team returned to Kahe beach, the storm water outfall, and then Nimitz and White Plains beaches, in order. Crews also continued to be responsive to reported findings from the public.
- Thursday, January 20 — By 8 a.m., personnel split into two teams, with one team returning to Kahe beach and the storm water outfall, and the other team returning to Nimitz and White Plains beaches. Crews also continued to be responsive to reported findings from the public.
- Friday, January 21 — Beginning at 8 a.m., the cleanup team returned to Kahe, Nimitz and White Plains beaches, as well as the storm water outfall. The WMH team found no medical waste.
- Monday, January 24 — WMH performed a final beach assessment and observed no waste attributed to the WGSL.

D. RESOURCES COMMITTED

Table 7 summarizes WMH's good faith estimate of the costs incurred by WMH during the removal action. During the removal action, WMH spent approximately $2,252,501.64 on third party costs. This cost estimate does not include internal costs (e.g., labor) incurred by WMH or the City. Invoices and backup for the costs incurred area are presented in Appendix E.

Table 7: Costs Incurred to WMH during Response Activities

Invoice No.	Date	Contractor	Description	Amount
2248	2/11/11	PCS	Vacuum truck and misc. storm clean up	$11,580.12
2249 R	2/11/11 (Revised 5/19/11)	PCS	E6 South Pond	$168,604.33
2261	4/15/11	GBI	Storm Water Response	$103,322.45
2262	4/15/11	GBI	Storm Water Response, Repair liner in E6, E6 Sump work	$220,761.00
2263	4/15/11	GBI	Storm Water Response, Repair liner in E6, E6 Sump work	$353,526.73
2267	4/30/11	American Environmental Group, LTD	Storm Related Liner Repairs	$78,901.26
2268	4/30/11	Watanabe Ing, LLP	Storm Event Legal Fees	$45,126.86
2269	4/30/11	AECOM	Storm Event Sampling	$17,935.67
2270	4/30/11	GEI	Storm Event Work Plans	$19,204.75
2274	5/19/11	GBI	Storm Related Costs including Repair Liner, E6 Leachate sump, repair damage to slope of West Berm Phase III	$125,918.41
2277	5/23/11	AECOM	CQA for Storm Event Costs	$40,008.62
2278	5/26/11		Security Cost Increase	$10,502.62
2279	5/24/11	PCS	Leachate	$242,562.88
2280	5/23/11	PCS	Miscellaneous Storm Event Charges	$4,867.67
2282	5/24/11	PCS	Storm Water, Sediment Pond Pumping	$226,465.28
2283	5/24/11	PCS	Storm Water, Sediment Pond and Cell E6 Pumping	$32,565.76
2286	5/24/11	GBI	Storm Related Costs including Repair Liner, E6 Leachate sump, repair damage to slope of West Berm Phase III	$250,564.30
2291	6/13/11	GBI	Storm Related Costs including Repair Liner, E6 Leachate sump, repair damage to slope of West Berm Phase III	$160,328.86
6705	7/31/11	GBI	Sedimentation Basin Restoration	$139,754.07
			TOTAL	$2,252,501.64

Note:
Costs do not include WMH markup and Hawaii general excise tax (GET).

II. EFFECTIVENESS OF REMOVAL ACTIONS

A. ACTIONS TAKEN BY OPERATOR

WMH executed all requirements of the Order in a timely manner. When unable to meet initial deadlines, extensions were requested and granted by the EPA. WMH hired subcontractors to perform the required activities on site and communicated regularly with the regulators.

B. ACTIONS TAKEN BY STATE AND LOCAL FORCES

The DOH Clean Water Branch performed storm water sampling at the site on January 13, 2011 in conjunction with samples collected for WMH by AECOM. Sampling included storm water from the site outfall location, the ocean outfall location, and an up-canyon location.

The City provided storm water pumping and transportation to the WWTP, conducted various beach cleanup activities, posted warning signs surrounding beaches, and provided public notices via press releases of the activities going on at WGSL.

C. ACTIONS TAKEN BY FEDERAL AGENCIES AND SPECIAL TEAMS

The EPA Region 9 office provided oversight of all response action activities including the On-Scene Coordinator and the RCRA Action Officer including review of the daily and weekly progress reports, and review/approval of all work plans and reports that were initiated as a result of the Order.

D. ACTIONS TAKEN BY CONTRACTORS, PRIVATE GROUPS, AND VOLUNTEERS

GEI Consultants, Inc. and Geosyntec Consultants, Inc. provided work plans for the activities required by the Order. PCS provided pumping and transport services for the storm water. GBI performed general earthwork and construction services during the execution of the work plans. AECOM provided Construction Quality Assurance oversight of the activities including documentation of work performed.

Volunteers were not present on site during the removal action; however, some volunteers in the surrounding community helped clear storm drains, sewer lines, and City beaches after the storm. However, these activities were not part of the response action.

III. RECOMMENDATIONS

A. MEANS TO PREVENT A RECURRENCE OF THE DISCHARGE OR RELEASE

The amount of rain that fell in December 2010 and January 2011 was extremely unusual and not a typical rainfall pattern for the area. The storm event concluding on January 13th was described as a "100-year storm" event. Based on rainfall data from the up-canyon Palehua rain gauge, the first major storm that occurred on December 19-20, 2010 generated a total recorded rainfall at the Palehua station of 10.44 inches. The second significant rain event occurred on December 26-27 and generated a total recorded rainfall at the nearby Palehua weather station of station of 5.68 inches. The storm was significant because it occurred less than one week after the December 19-20 storm. The third and largest storm occurred on January 12-13, 2011. The storm produced 12.21 inches of rain in total, with 10.68 inches of rain falling in a 24-hour period. Most significant was the short-term intensity of this storm, which generated 7.63 inches of rain during a 6-hour period, 6.23 inches of rain over a 3-hour period, and 3.65 inches of rain over a 1-hour period.

Prior to completion of the western storm water diversion system, run-on to the WGSL was managed with on-site surface water conveyance systems which routed storm water through the site. The western storm water diversion system (also described as the offsite surface water conveyance) is designed bypass the 24-hour, 25-year storm flows and can handle flow from a 100-year, 24-hour storm with minimal or no damage occurring. When all portions of the system are completed, the system will bypass run-on around the landfill and discharge to a stilling basin to be constructed below the existing sedimentation basin.

The upper portion of the western storm water diversion system was functionally complete on February 15, 2011 and constructed per the approved design specifications. A *Surface Water Management Plan* has been submitted to and approved by the EPA that describes the surface water management features present at WGSL. More information can be found in the *Surface Water Management Plan*, located in Appendix D.